

REMARKS

Claims 1-44 are pending. Of those, claims 1-28, 33-40 and 42 have been withdrawn from consideration.

Applicants thank the Examiner for recognizing that claims 32, 43 and 44 contain allowable subject matter and, therefore, would be allowable if rewritten in independent form including all of the limitations of their respective base claims and any intervening claims.

Claim 29 was rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,326,612 (*Elkind et al.*) in view of U.S. Patent No. 6,704,470 (*Schneider et al.*). Applicants respectfully disagree with that rejection.

Claim 29 recites a sensor with an emitter, a detector and a reflector arranged so that the emitter directs radiation through an analyte space to the reflector and so that the radiation will be reflected back through the analyte space to the detector. An example of those features is shown in FIGS. 1 and 3 of the present application where, a sensor includes an emitter 28, a detector 30 and a reflector 76 arranged so that the emitter 28 directs radiation through an analyte space 75 to the reflector 76 and so that the radiation will be reflected back through the analyte space 75 to the detector 30. Neither the *Elkind et al.* patent, nor the *Schneider et al.* patent, nor any combination thereof discloses or suggests those features.

The *Elkind et al.* patent discloses a sensing system for making analytical measurements regarding a sample 50 of interest. See FIGS. 1 & 2. The sensing system includes: 1) a channel (formed in flow cell 56) that carries the sample 50 of interest; 2) a sensing surface 58 (e.g., a slide of material with a thin coating thereon) that is in contact with the sample 50 (see column 5, lines 29-30); 3) a light source 68 on a

platform 38; 4) a photodetector array 74 on the same platform 38; and 5) a reflective surface 72 above the platform 38.

In operation, light rays 66 emanate from the light source 68 and hit the sensing surface 58. See Column 5, lines 36-46. In surface plasmon resonance sensing applications, the angle of incident light at which resonance occurs is dependent on the refractive index of the sample 50 that is in contact with the sensing surface 58. See, e.g., column 1, lines 26-42. Reflective components 70 of the light rays 66 are reflected from the sensing surface 58 onto the reflective surface 72, and reflected again from reflective surface 72 onto the photodetector array 74. Each sensing area in photodetector array 74 produces a signal with a voltage that is proportional to the intensity of the light striking that area of photodetector array 74. Column 5, lines 52-57. The resonance angle can be determined based on the intensity of light striking each area. By detecting the resonance angle, the refractive index of the sample 50 is determined, which is indicative of other properties of the sample 50. Column 1, lines 36-39.

The *Schneider et al.* patent discloses an optoelectronic gas sensor chip (see FIG. 5) that includes photosensitive elements 12 arranged in one plane on a substrate 10. Column 6, lines 47-50. The chip is mounted in a casing 20 and protected by a cover 21. Column 7, lines 5-19. Cover 21 has openings 22 so that gas can penetrate (see arrow). The photosensitive elements 12 are covered with a layer 15 of optode material. A central opto-transmitter 23 is arranged a distance away from the sections of the optode material and projects above the top surface of optode material 15. The inside wall of casing cover 21 has a mirrorized surface 24.

During operation, light is emitted from opto-transmitter 23 into the gas atmosphere in space 25 above optode layers 15, and then reaches photosensitive elements 12 through

optode material 15 either directly or after being reflected on the inside wall or on mirrorized inside wall 24 of casing cover 21.

The Office Action recognizes that the *Elkind et al.* sensing device does not include an emitter, a detector and a reflector arranged so that radiation from the emitter will be reflected by the reflector *back through said analyte space to said detector*, as is recited in claim 29. Nevertheless, the Office Action asserts that a person of ordinary skill would have considered it obvious to modify the *Elkind et al.* sensing device in view of the *Schneider* patent to obtain those features. Applicants respectfully disagree. Indeed, there are several clear reasons why a person of ordinary skill would not have considered it obvious to modify the *Elkind et al.* sensing device to include those features.

First, a person of ordinary skill would not have been motivated to make such modifications to the *Elkind et al.* sensing device. The Office Action asserts that such modifications would have "improved sensitivity of the sensor due to an increased/doubled effect by the analyte space on the emitted light." See Office Action, ¶4. However, that is incorrect. As explained above, operation of the *Elkind et al.* sensing device involves monitoring only those portions of light (70 in FIG. 2) that are reflected off of the sensing surface 58. Those reflected portions of light do not pass through the sample 50 at all and, therefore, do not pass (either directly or indirectly) through an analyte space, as is recited in claim 29. Since operation of the *Elkind et al.* sensing device does not require that the reflected portions of light pass through an analyte space (either directly or indirectly), modifying the sensing device to include those features would not have "improved sensitivity of the sensor due to an increased/doubled effect by the analyte space on the emitted light" as suggested

in the Office Action. Accordingly, a person of ordinary skill would not have been motivated to make such modifications for that reason.

The Office Action also states that making such modifications would "provide integration into a single unit for reduced size." Applicants respectfully disagree. Indeed, the *Elkind et al.* cartridge sensing device 10 is a fully operative sensing arrangement and, in fact, includes a digital signal processing unit 78 to perform qualitative and quantitative analysis of sensed data. See column 5, lines 59-67. It is not clear what kind of "integration" would be achieved by making the modifications proposed in the Office Action. Incorporating the modifications set forth in the Office Action would not enhance the functionality of *Elkind et al.*'s sensing device at all.

Furthermore, even if a person of ordinary skill were motivated to attempt the modifications set forth in the Office Action, it is unclear how such modifications would be made. For example, the *Elkind et al.* sensor (see FIG. 2) includes a complicated piping network with inlets 52, a valve 62, one or more reservoirs 64 with, for example, materials used for calibration purposes, cleaning purposes, or reagents or reactants intended to react with the sample 50 (column 5, lines 25-30), a flow cell 56, a waste unit 80 and fluidic connectors 36 for coupling to an external analytical unit 30, etc. Implementing the supposedly obvious modifications set forth in the Office Action would likely require massive modification and/or elimination of most of those components. It is unclear how or why a person of ordinary skill would have implemented such massive modifications. Accordingly, it is unlikely that a person of ordinary skill would have considered such extensive modifications to be obvious.

Furthermore, even if a person of ordinary skill were motivated to attempt those modifications, the cartridge sensing

device 10 would presumably need to be sealed somehow to contain the sample 50 being analyzed. Since the cartridge sensing device 10 is intended to be connected both to a sample source (via inlet 52) and to an analytical unit (via fluidic connector 36 and electrical connectors 34), the modifications necessary to seal the cartridge would presumably be extensive and complex, hardly obvious.

Claim 29 should be allowable for at least the foregoing reasons.

Claim 41 also was rejected under 35 U.S.C. §103(a) as being unpatentable over the *Elkind et al.* patent in view of the *Schneider et al.* patent. Applicants respectfully disagree with that rejection for reasons that are similar to those discussed above with reference to claim 29.

In particular, claim 41 recites a sensor with an emitter, a detector and a reflector fixed so that radiant energy emitted by the emitter will be reflected to the detector, whereby radiant energy passing to and from the reflector will pass through an analyte. For at least the same reasons as discussed above with reference to claim 29, the asserted references, either alone or in combination with, do not disclose or suggest those features.

Claim 41 should be allowable for at least the foregoing reasons.

Claims 30 and 31 were rejected under 35 U.S.C. §103(a) as being unpatentable over the *Elkind et al.* patent, in view of the *Schneider et al.* patent and further in view of U.S. Patent No. 6,045,756 (*Carr et al.*).

Claims 30 and 31 depend from claim 29, which recites a sensor with an emitter, a detector and a reflector arranged so that the emitter directs radiation through an analyte space to the reflector and so that the radiation will be reflected back through the analyte space to the detector. As discussed above,

neither the *Elkind et al.* patent, nor the *Schneider et al.* patent, nor any combination thereof discloses or suggests those features. Nor does the *Carr et al.* patent disclose or suggest those features.

The *Carr et al.* patent merely discloses a miniaturized sensor package 100 that includes contacts 105, 107, 109 which extend from three walls of the package 100. See FIG. 5. The *Carr et al.* patent does not disclose or suggest a sensor with an emitter, a detector and a reflector arranged so that the emitter directs radiation through an analyte space to the reflector so that the radiation will be reflected back through the analyte space to the detector, as recited in claim 29.

Claims 30 and 31 should be allowable for at least the foregoing reasons.

As it is believed that all of the rejections set forth in the Official Action have been fully met, favorable reconsideration and allowance are earnestly solicited.

If, however, for any reason the Examiner does not believe that such action can be taken at this time, it is respectfully requested that he/she telephone applicants' attorney at (908) 654-5000 in order to overcome any additional objections which he/she might have.

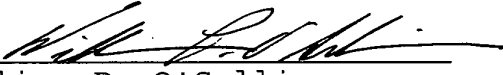
Application No.: 10/711,945

Docket No.: TESSERA 3.0-395

If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

Dated: February 20, 2007

Respectfully submitted,

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